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30V COMPLEMENTARY DUAL ENHANCEMENT MODE MOSFET
Product Summary

Device	$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = 25^\circ C$
Q1	30V	28mΩ @ $V_{GS} = 10V$	7.1A
		45mΩ @ $V_{GS} = 4.5V$	5.6A
Q2	-30V	25mΩ @ $V_{GS} = -10V$	-7.4A
		41mΩ @ $V_{GS} = -4.5V$	-5.7A

Description and Applications

This new generation complementary dual MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

- Motor control
- Backlighting
- DC-DC Converters
- Power management functions

Features and Benefits

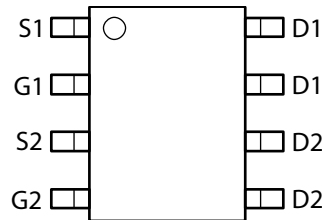
- Low on-resistance
- Fast switching speed
- "Green" Component and RoHS Compliant (Note 1)

Mechanical Data

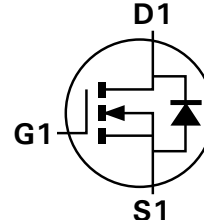
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.074 grams (approximate)



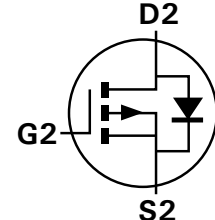
TOP VIEW



Top view



Q1 N-Channel

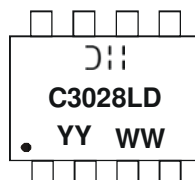


Q2 P-Channel

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMC3028LSD-13	C3028LD	13	12	2,500

Note: 1. Diodes, Inc. defines "Green" products as those which are Eu RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.'s "Green" Policy can be found on our website. For packaging details, go to our website

Marking Information


D = Manufacturer's Marking
 C3028LD = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01-52)

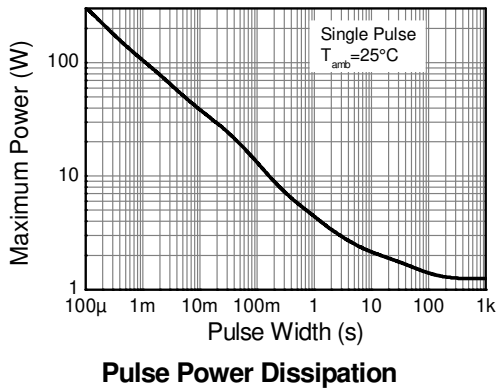
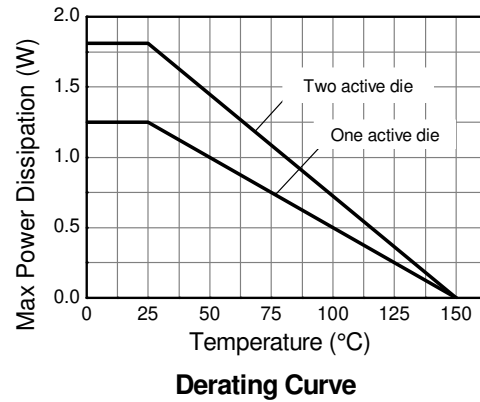
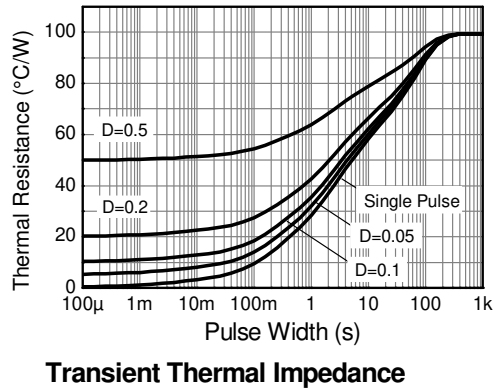
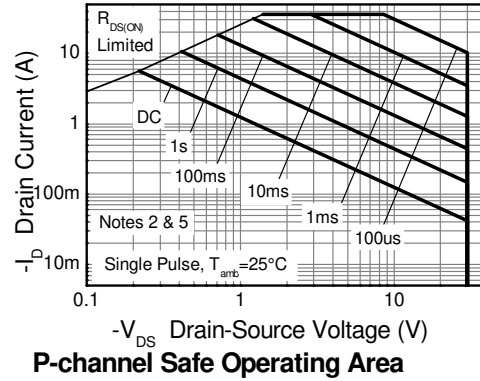
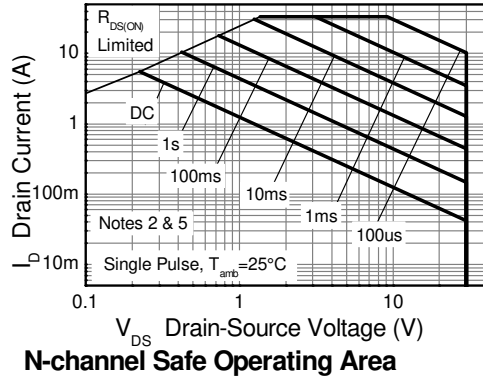
Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	N-Channel - Q1	P-Channel - Q2	Units
Drain-Source Voltage			V _{DSS}	30	-30	V
Gate-Source Voltage			V _{GSS}	±20	±20	V
Continuous Drain Current	V _{GS} = 10V	(Notes 3 & 5)	I _D	7.1	-7.4	A
		T _A = 70°C (Notes 3 & 5)		5.7	-5.9	
		(Notes 2 & 5)		5.5	-5.8	
		(Notes 2 & 6)		6.6	-6.8	
Pulsed Drain Current	V _{GS} = 10V	(Notes 4 & 5)	I _{DM}	34	-36	A
Continuous Source Current (Body diode)		(Notes 3 & 5)	I _S	3.5	-3.5	A
Pulsed Source Current (Body diode)		(Notes 4 & 5)	I _{SM}	34	-36	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	N-Channel - Q1	P-Channel - Q2	Unit
Power Dissipation	(Notes 2 & 5)	P _D	1.3		W
Linear Derating Factor			10		mW/°C
Power Dissipation	(Notes 2 & 6)	P _D	1.8		W
Linear Derating Factor			14		mW/°C
Power Dissipation	(Notes 3 & 5)	P _D	2.1		W
Linear Derating Factor			17		mW/°C
Thermal Resistance, Junction to Ambient	(Notes 2 & 5)	R _{θJA}	100		°C/W
	(Notes 2 & 6)		70		
	(Notes 3 & 5)		60		
Thermal Resistance, Junction to Lead	(Notes 5 & 7)	R _{θJL}	51	46	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150		°C

- Notes:
2. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 3. Same as note (2), except the device is measured at t ≤ 10 sec.
 4. Same as note (2), except the device is pulsed with D= 0.02 and pulse width 300 μs. The pulse current is limited by the maximum junction temperature.
 5. For a dual device with one active die.
 6. For a device with two active die running at equal power.
 7. Thermal resistance from junction to solder-point (at the end of the drain lead).

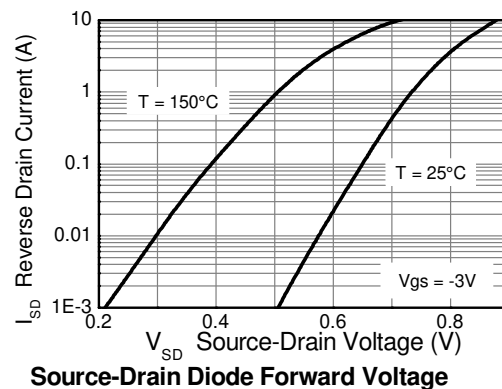
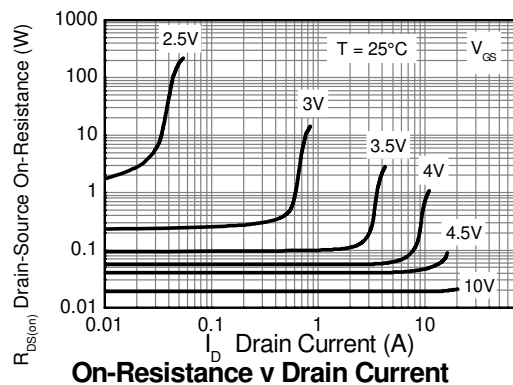
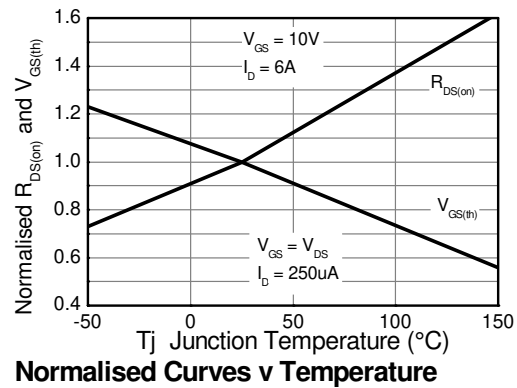
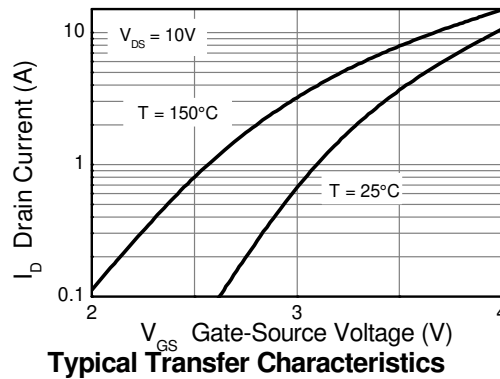
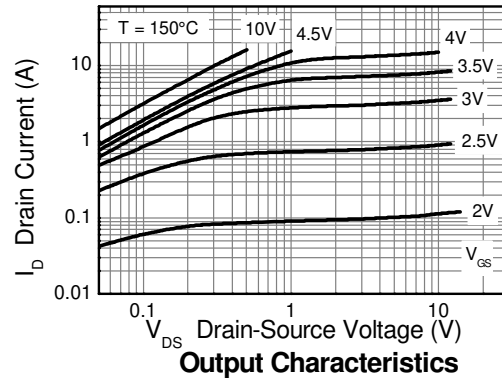
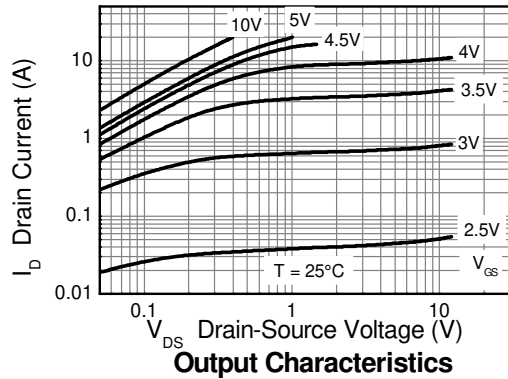


Electrical Characteristics – Q1 N-Channel @T_A = 25°C unless otherwise specified

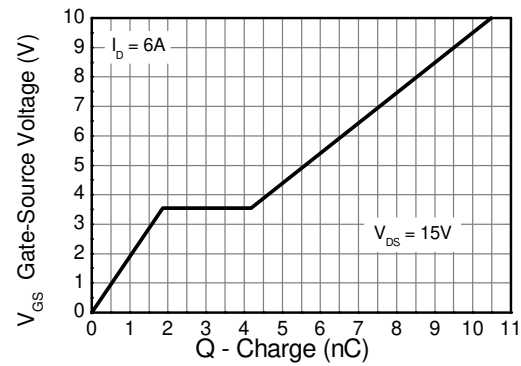
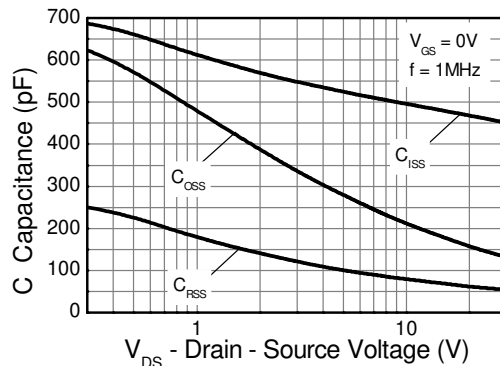
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	1.0	—	3.0	V	I _D = 250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 8)	R _{DS (ON)}	—	—	0.028	Ω	V _{GS} = 10V, I _D = 6.0A
				0.045		V _{GS} = 4.5V, I _D = 4.9A
Forward Transconductance (Notes 8 & 9)	g _{fs}	—	12	—	S	V _{DS} = 15V, I _D = 6.0A
Diode Forward Voltage (Note 8)	V _{SD}	—	0.68	1.2	V	I _S = 1.7A, V _{GS} = 0V
Reverse recovery time (Note 9)	t _{rr}		11.5	—	ns	I _S = 1.7A, di/dt= 100A/μs
Reverse recovery charge (Note 9)	Q _{rr}	—	4.4	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	472	—	pF	V _{DS} = 15V, V _{GS} = 0V f= 1MHz
Output Capacitance	C _{oss}	—	178	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	65	—	pF	
Total Gate Charge	Q _g	—	5.2	—	nC	V _{DS} = 15V, V _{GS} = 4.5V I _D = 6A
Total Gate Charge	Q _g	—	10.5	—	nC	V _{DS} = 15V, V _{GS} = 10V I _D = 6A
Gate-Source Charge	Q _{gs}	—	1.86	—	nC	
Gate-Drain Charge	Q _{gd}	—	2.3	—	nC	
Turn-On Delay Time (Note 10)	t _{D(on)}	—	2.5	—	ns	V _{DD} = 15V, V _{GS} = 10V I _D = 1A, R _G ≐ 6.0Ω
Turn-On Rise Time (Note 10)	t _r	—	3.1	—	ns	
Turn-Off Delay Time (Note 10)	t _{D(off)}	—	14	—	ns	
Turn-Off Fall Time (Note 10)	t _f	—	9.7	—	ns	

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
9. For design aid only, not subject to production testing.
10. Switching characteristics are independent of operating junction temperatures.

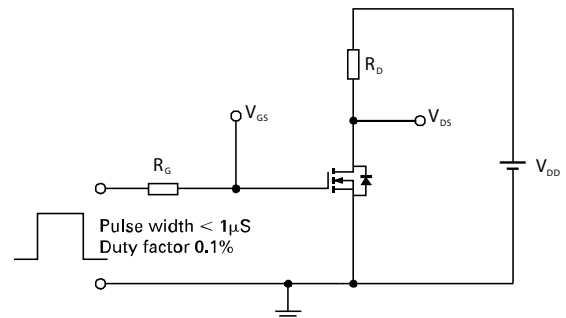
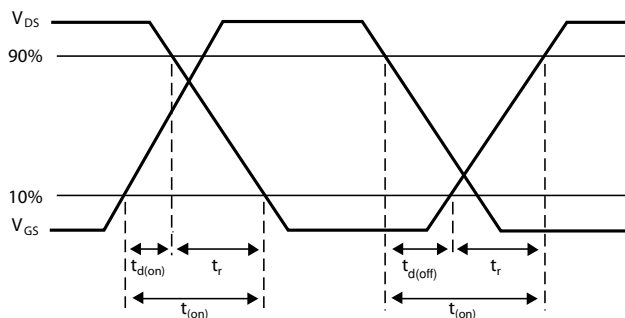
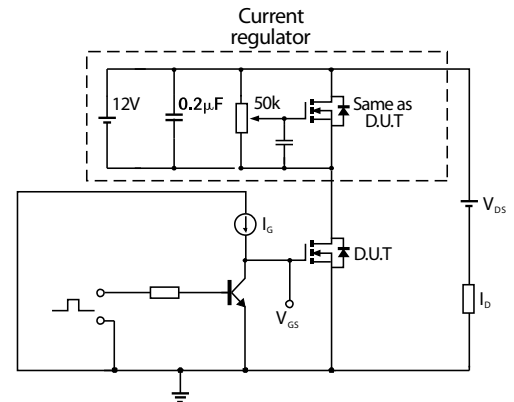
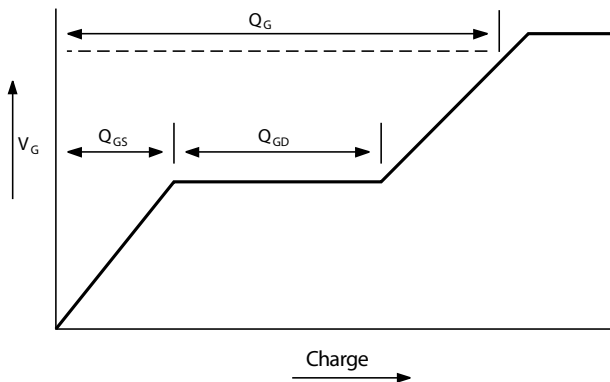
Q1 N-Channel



Q1 N-Channel continued



Test Circuits – Q1 N-Channel



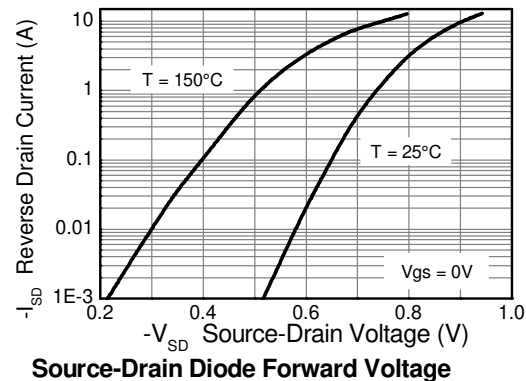
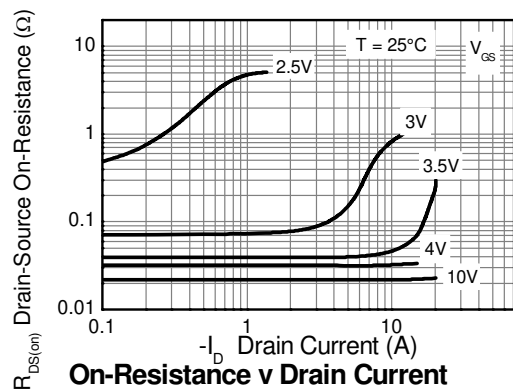
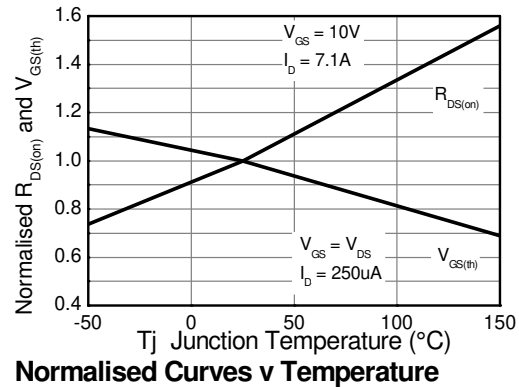
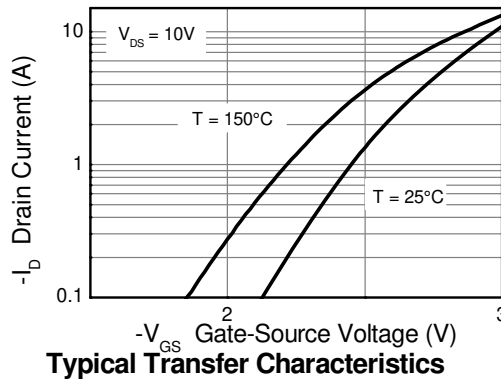
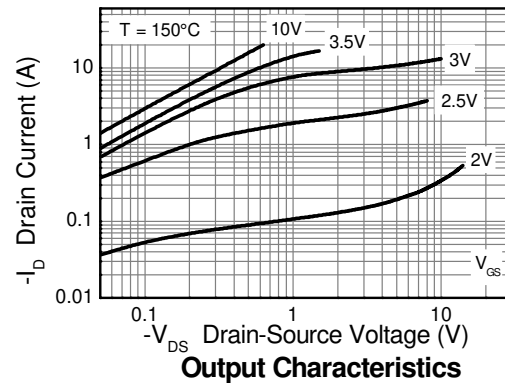
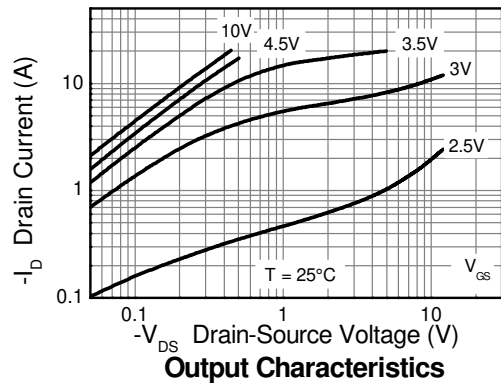
Electrical Characteristics – Q2 P-Channel

@T_A = 25°C unless otherwise specified

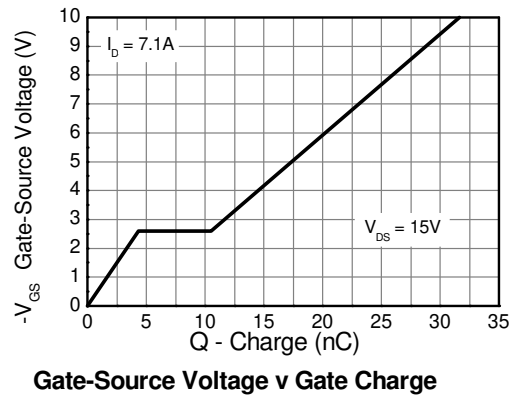
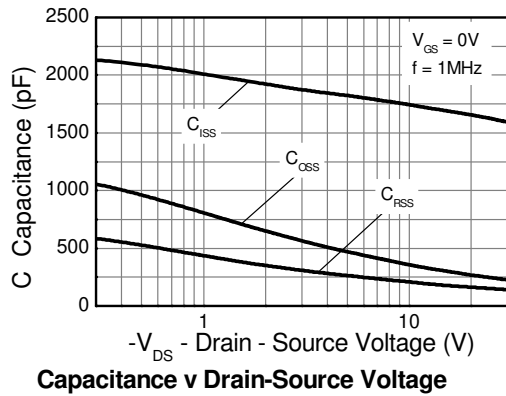
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	I _D = -250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-0.5	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	-1.0	—	-3.0	V	I _D = -250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 8)	R _{DS (ON)}	—	—	0.025	Ω	V _{GS} = -10V, I _D = -7.1A
				0.041		V _{GS} = -4.5V, I _D = -5.5A
Forward Transconductance (Notes 8 & 9)	g _{fs}	—	18.6	—	S	V _{DS} = -15V, I _D = -7.1A
Diode Forward Voltage (Note 8)	V _{SD}	—	-0.80	-1.2	V	I _S = -1.7A, V _{GS} = 0V
Reverse recovery time (Note 9)	t _{rr}		16.2	—	ns	I _S = -2.2A, di/dt= 100A/μs
Reverse recovery charge (Note 9)	Q _{rr}	—	10	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	1678	—	pF	V _{DS} = -15V, V _{GS} = 0V f= 1MHz
Output Capacitance	C _{oss}	—	303	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	178	—	pF	
Total Gate Charge	Q _g	—	16.4	—	nC	V _{DS} = -15V, V _{GS} = -4.5V I _D = -7.1A
Total Gate Charge	Q _g	—	31.6	—	nC	V _{DS} = -15V, V _{GS} = -10V I _D = -7.1A
Gate-Source Charge	Q _{gs}	—	4.3	—	nC	
Gate-Drain Charge	Q _{gd}	—	6.2	—	nC	
Turn-On Delay Time (Note 10)	t _{D(on)}	—	3.5	—	ns	V _{DD} = -15V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω
Turn-On Rise Time (Note 10)	t _r	—	4.9	—	ns	
Turn-Off Delay Time (Note 10)	t _{D(off)}	—	44	—	ns	
Turn-Off Fall Time (Note 10)	t _f	—	28	—	ns	

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
9. For design aid only, not subject to production testing.
10. Switching characteristics are independent of operating junction temperatures.

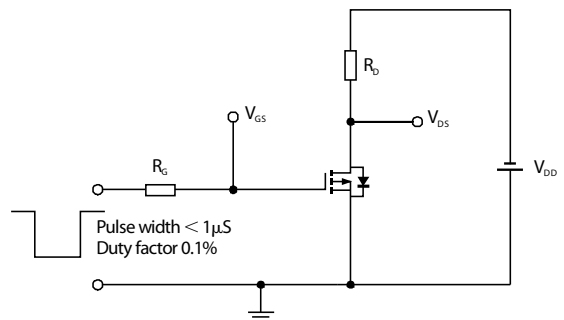
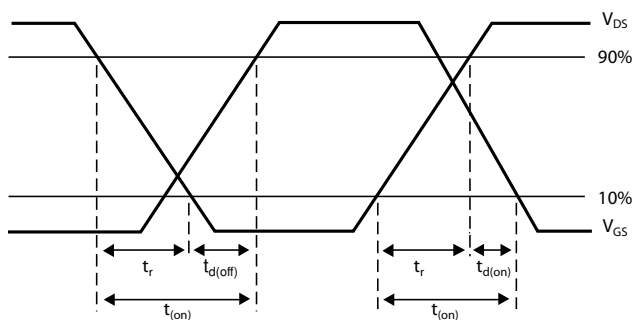
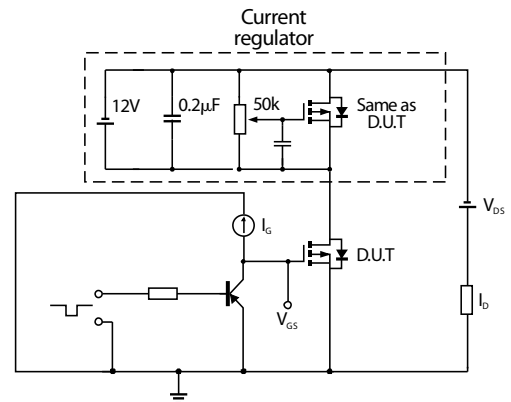
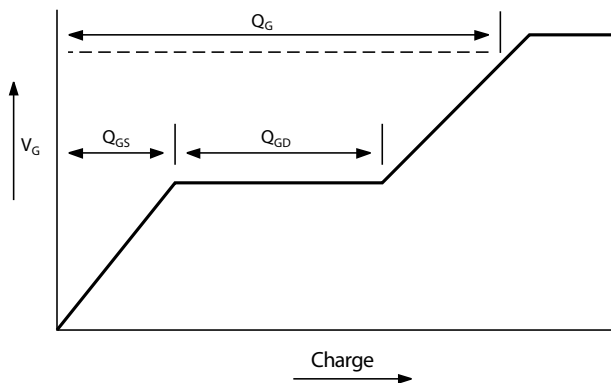
Q2 P-Channel



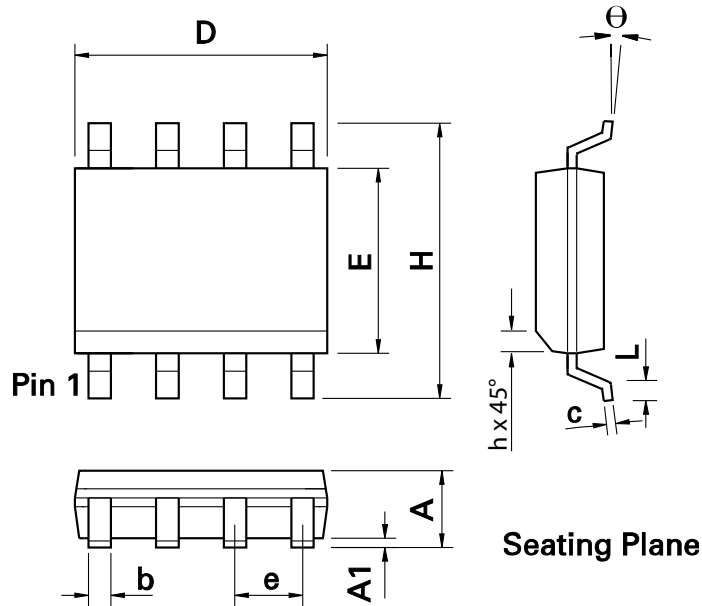
Q2 P-Channel continued



Test Circuits – Q2 P-Channel

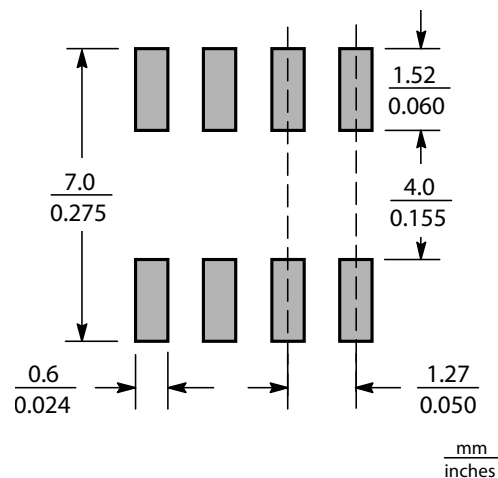


Package Outline Dimensions



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.053	0.069	1.35	1.75	e	0.050 BSC		1.27 BSC	
A1	0.004	0.010	0.10	0.25	b	0.013	0.020	0.33	0.51
D	0.189	0.197	4.80	5.00	c	0.008	0.010	0.19	0.25
H	0.228	0.244	5.80	6.20	θ	0°	8°	0°	8°
E	0.150	0.157	3.80	4.00	h	0.010	0.020	0.25	0.50
L	0.016	0.050	0.40	1.27	-	-	-	-	-

Suggested Pad Layout



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